Appendix J
SOW 6643-A-0398

E-2 and C-2 RECONFIGURABLE FLIGHT TRAINING DEVICE (RFTD)
2C85

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TRAINER DESCRIPTION FOR DEVICE 2C85
Located at
NAVAL AIR FACILITY (NAF) ATSUGI, JAPAN

1.1 DESCRIPTION FOR TRAINING DEVICE 2C85, RFTD

    1.1.1 <u>Function and General Description.</u> The E-2 and C-2 Reconfigurable Flight Trainer Device (RFTD) provides a realistic E-2C/C-2A simulation and operational training environment for various existing and impending aircraft configurations in advance of actual fleet exposure to improve flight crew safety skills. The RFTD provides pilot training to the extent of instrument scan, take-off and landing, malfunctions and select NATOPS procedures. The E-2 and C-2 Reconfigurable Flight Trainer Device (RFTD) is capable of providing multiple configurations of one or more similar aircraft on the same device. All components of the RFTD are designed to permit training of both E-2C and C-2A aircraft configurations without removal or replacement of hardware.

    The hardware design for the device is the same regardless of the aircraft configuration. The RFTD includes actual aircraft flight controls, graphical instrumentation, flight/engine status indication, touch-screen enabled cockpit switchology, integrated instructor operator station (IOS), out-the-window visual display, and digital computers necessary to provide sight, sound and feel stimulus to the student and mission control to the instructor. All components are inside or attached to the base-frame in the modular design. The device is broken down into the following major components:
       a) Device Base Frame and Support Structures
       b) Power Distribution System
       c) Host Computational System
       d) Instructor Operator Station
       e) Cockpit Display System
       f) Primary Flight Control Loading System with Columns, Pedals, and Control
          Wheels
       g) Throttle Quadrant
       h) Aural Cue System
       i) Distributed Input/Output (I/O) System
       j) Image Generation System
       k) Out-the-Window Display System
       l) Pilot and Copilot Seats with Rails

    1.1.2 <u>Trainee Station.</u> The RFTD design presents the simulated cockpit instrumentation to the students utilizing commercially available touch screens. The touch screen panels are arranged for direct view by the pilot and copilot of the main instrument panel.

    Each of the touch screen displays is connected to individual graphics processing computers that process the touch input from the respective touch screen on the Main Instrument Panel. This allows simultaneous, multi-user interaction of the touch screen system.

    The Electronic Flight Display System is comprised of Primary Flight Displays (PFD), Electronic Standby Indicators (ESI), and display control panels to provide display of flight, navigation, surveillance and miscellaneous systems information. The PFD receives display data from all connected devices and the

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Display Control Panel (DCP) is utilized to select one or more data sources for actual display.

Two DCPs, one for the pilot and one for the copilot, are installed in the instrument panel. In normal operating mode, each DCP controls its onside PFD. The DCP provides an integrated set of controls for PFDs.

Two Electronic Standby Indicators (ESIs) are installed, one each for pilot and copilot.

1.1.3 <u>Instructor Operator Station (IOS).</u> The instructor station provides the capability to initiate and control the training situation. The IOS has two touch screen monitors, a keyboard, and a mouse. A third display monitor may be incorporated for the Moving Map function. One monitor is mounted on an articulated arm, allowing the instructor to move around the IOS area while maintaining a clear view of the IOS displays.

The right monitor displays the IOS main page with aircraft positional information, mode control, initial conditions control, visual system control, malfunction control, and data entry. It also displays information regarding the status of the training session.

The left monitor displays a Sectional Map view of the current area, which can be zoomed in/out using boxes, slider bar or zoom controls. Other map views include flat earth/state outline view, Approach Plate (selectable with pull down menu), Ground Controlled Approach (GCA) view (defaults to same runway as Approach Plate but selectable), Carrier Controlled Approach (CCA), Dual View (Approach Plate/GCA/CCA side by side), and ownship repositioning (allows the instructor to click-place the ownship at various approach locations at current airfield).

Data entry items within the IOS pages are tab accessible selected by mouse or touch screen or selected through the menus.

The IOS displays the selected trainer configuration and provides the ability to have independent data directories that contain the configuration dependent data. Items that differ per configuration are the instrument repeaters, navigation/communication items, malfunctions, and procedures. The remainder of the IOS will remain the same regardless of configuration.

The Visual System data at the IOS is common for all aircraft configurations. The same visual features such as weather, thunderstorms, and lighting controls are available.

1.1.4 <u>Control Station.</u> A Touch Screen will be mounted on the front of the pedestal and will have displays for the various components which reside in the different aircraft configurations.

1.1.5 <u>Computer System(s) and Peripherals</u>. The Host Computer is a 6U rack-mount chassis, Single Board Computer (SBC), and 19-slot passive backplane. The 19 slot backplane consists of an X16 PCIe slot, an X8 PCIe slot, eight PCI-X 64-bit/66 MHz slots, eight PCI-X 32-bit/32MHz slots, and a PICMG 1.3 slot for the SBC.

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The Host Computer includes a 500GB SATA shuttle mounted hard-disk drive. A DVD-RW provides data storage and retrieval from both DVD and CD-ROM media types in the +R, -R, +RW, -RW, and dual-layer (DL) formats.

The Operating System (OS) for the Host Computer is Redhat Enterprise Linux Version 5.1.

The CDU hardware on the pedestal consists of LCD cockpit displays each with touch screen keyboard and operational screens.

1.1.6 Aircraft Common Subsystem. N/A

1.1.7 Power System. The device will utilize standard PC system facility power. It will contain a UPS capable of sustaining power to allow an orderly shutdown for all systems except the control loading system. The control loading system will immediately lose power upon facility power loss.

1.1.8 Visual/Video System. The visual/video system consists of a two channel Image Generator along with two High Resolution (1600x1200) displays for the Out-The-Window displays as the Pilot and Copilot front windows.

Displays replace the RFTD: MFCDU, AFCS Panel and IFF hard panels. Several other displays are accessible as icons on the main instrument panel.

Graphics viewed and interacted with are rendered on the touch screens with a 30Hz refresh and update rate to provide smooth, non-jerky motion on the animated portions of the displays.

1.1.9 Motion System. N/A

1.1.9.1 Control Loading. The RFTD utilizes E-2C Control Columns, Rudder Pedals, and throttle quadrant.

1.1.10 Air Conditioning System. TBD

1.1.11 Motor Generator Sets. N/A

1.1.12 Hydraulic System. N/A

1.1.13 Modifications. None planned.

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2.1 <u>ILLUSTRATIONS</u>: Complete lists of illustrations are available at training site.
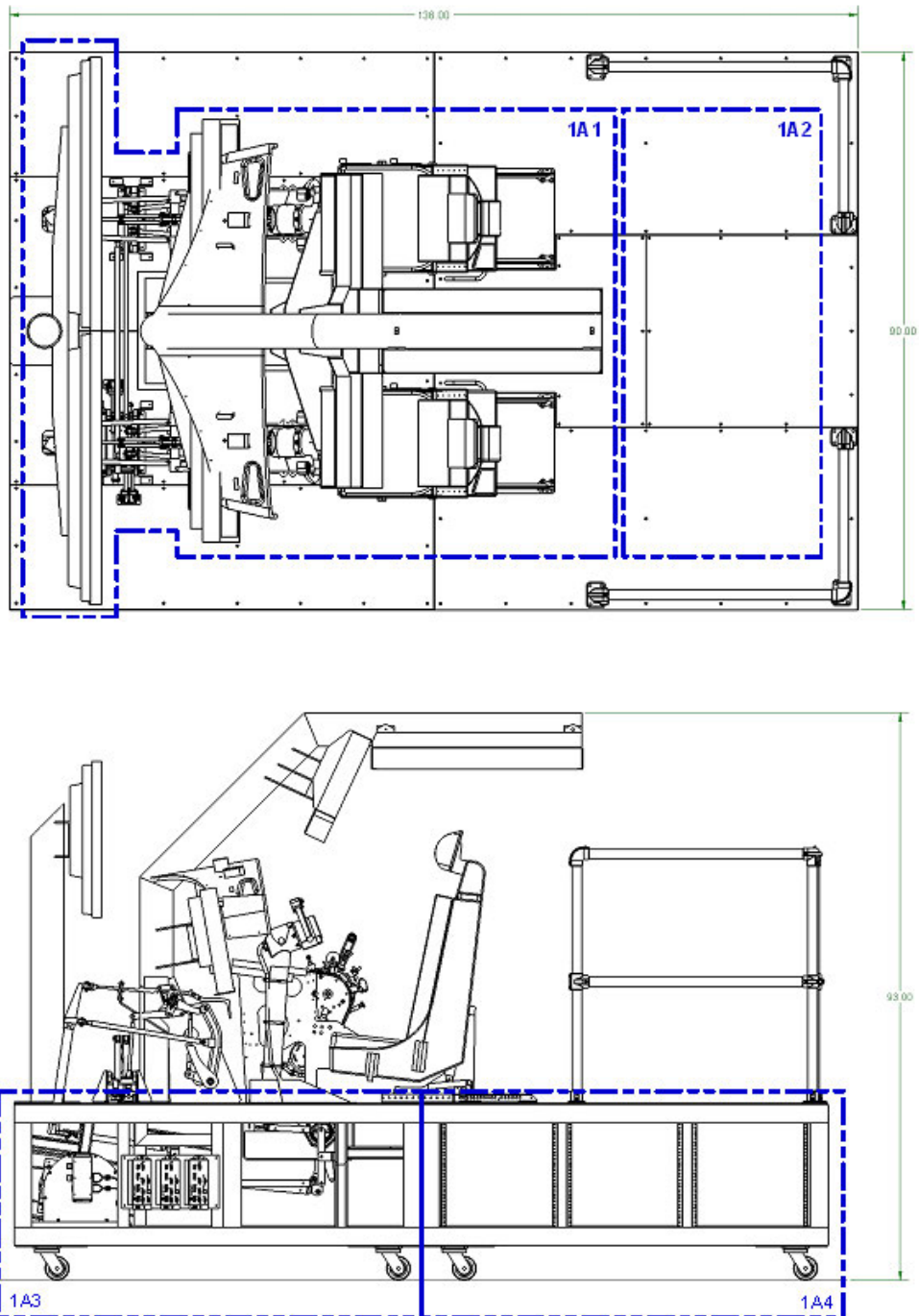
    a. Figure 1: Plan view.

Figure 1: RFTD Plan View

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3.1 <u>Mission Essential Subsystem Matrix (MESM)</u>: Available at training site.

4.1 <u>Maintenance Support Hours (MSH)</u>

Device: 2C85 RFTD
Serial #:   002
LOCATION: NAF Atsugi, Japan, Hangar 183 Room 101 North

TRAINER OPERATION: On-Call Preventative/Corrective Maintenance

2.0 HOUR OPTION (10 hrs. per week)*			6.0 HOUR OPTION (30 hrs. per week)*		
FISCAL <u>YEAR</u>	(Monday-Friday) <u>FROM</u>	<u>TO</u>	FISCAL <u>YEAR</u>	(Monday-Friday) <u>FROM</u>	<u>TO</u>
13	1000	1200	13	0800	1400
14	1000	1200	14	0800	1400
15	1000	1200	15	0800	1400
16	1000	1200	16	0800	1400
17	1000	1200	17	0800	1400

4.0 HOUR OPTION (20 hrs. per week)*

FISCAL <u>YEAR</u>	**(Monday-Friday)** **FROM**	**TO**
13	**0800**	**1200**
14	**0800**	**1200**
15	**0800**	**1200**
16	**0800**	**1200**
17	**0800**	**1200**

Maintenance hours for PMS/CMS are 0700-1500 Monday through Friday. The RFTD is an on-call device not to exceed eight (8) hours a day. The Contractor shall perform daily system power on, system check out, scenario initialization and final system checkout and power down. The Contractor shall conduct preventative maintenance and corrective maintenance in accordance with device Original Equipment Manufacturer (OEM) and COTS OEM documentation as appropriate. The Contractor shall ensure qualified support is available within 15 minutes response time during MSH. Technician will notify the site/device Scheduling Authority/Contracting Officer's Representative (COR) and Site Manager (SM), if device is not up and operational within four (4) hours after being notified.

The RFTD may be used for training before, during and after MSHs. The Contractor shall inspect and repair any discrepancies reported by the Government or as discovered through CMS actions.   The Contractor shall use its standard COMS Maintenance/Support Plan procedures and paragraph 4.3.2.5 of the SOW as the appropriate level of service and support upon request.

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5.1 <u>Aircraft Common Equipment (ACE)</u>. None planned.

     5.1.1 Trainer Support Package (TSP): Includes Spare Parts, Technical Data Support Package, and Software Support Material. The formal inventory (i.e. spare parts, technical data support package, and software support material, etc.) shall be those items identified during the mobilization period and stated in the yearly Inventory/Utilization Data Report. The Contractor shall comply with the development, maintenance and submission requirements for this report, as stated in the applicable CDRL item.

6.1 <u>PARTIAL MISSION CAPABILITY (PMC) STANDARD DEVICE 2C85</u>

PMC is a condition in which degraded operation (less than 100% operationally ready) still permits meaningful training or alternative training to be accomplished. The percentage of degradation is relative to the Essential Operational Capability (EOC) codes, which are derived from the MESM. The relationship between missions and training device systems/subsystems, and EOC codes are represented in the MESM.

The following is the schedule of percentage of degradation for the EOC codes as shown in the MESM.

EOC	% MISSION CAPABLE	% OF DEGPADATION
B	100	0
C	90-99	10
D	80-89	20
E	70-79	30
F	60-69	40
G	50-59	50
H	40-49	60
J	0-39	70

The MESM for device 2F110, E-2C Weapon System applies.

7.1 <u>Floor Plans and Projected Additions</u>: Available at training site.

8.1 <u>JANITORIAL REQUIREMENTS</u>: See Appendix AA.